



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/692,093	10/22/2003	Jinru Bian	02005US	8299

7590

05/05/2006

Rodel Holdings, Inc.
Suite 1300
1105 North Market Street
Wilmington, DE 19899

EXAMINER

CHEN, ERIC BRICE

ART UNIT

PAPER NUMBER

1765

DATE MAILED: 05/05/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/692,093

Applicant(s)

BIAN, JINRU

Examiner

Eric B. Chen

Art Unit

1765

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 March 2006.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) 10 is/are withdrawn from consideration.
- 5) ☒ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-9 is/are rejected.
- 7) ☒ Claim(s) 2 and 3 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☐ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: _____

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on Feb. 9, 2006 has been entered.

Claim Objections

2. Claims 2 and 3 are objected to because of the following informalities: for claim 2 apparently "selected from *of* carboxylic acids" (emphasis added) should be -- selected from carboxylic acids --; for claim 3, apparently "organic *or salt* acid" (emphasis added) should be -- organic salt or acid --. Otherwise, "organic or salt acid" would lack the proper antecedent basis. Appropriate correction is required.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1-9 stand rejected under 35 U.S.C. 102(b) as being anticipated by Tsuchiya et al. (U.S. Patent Appl. Pub. No. 2001/0006224).

5. As to claim 1, Tsuchiya discloses method for removal of a barrier film on a semiconductor wafer by polishing with a polishing pad and a polishing fluid (paragraph 0058), the polishing fluid comprising abrasive particles in the range of 0.1% to 5% by weight (paragraph 0028) and an acid or salt (paragraph 0029) consisting of an organic acid, salt (paragraph 0029) or mixture thereof in the range of 0.5-10% by weight (paragraph 0050) in an aqueous solution at a pH of 7 to 12 ("preferably 9 or less," paragraph 0043). Tsuchiya discloses that an oxidizing agent "may be added" to the polishing slurry (paragraph 0045). Therefore, the oxidizing agent is optional and Tsuchiya includes an embodiment with no addition of an oxidizing agent. Tsuchiya also discloses that inorganic salts "may be at least one..." (paragraph 0029) and thus includes an embodiment with no addition of inorganic salts.

6. As to claim 2, Tsuchiya discloses that the organic acid or salt is selected from carboxylic acids, hydrocarboxylic acids containing a hydroxyl group, and amino acids (paragraph 0046).

7. As to claim 3, Tsuchiya discloses that the organic acid or salt is selected from citric acid, maleic acid, formic acid, acetic acid, propionic acid, butyric acid, valeric acid, acrylic acid, lactic acid, succinic acid, malic acid, malonic acid, succinic acid, tartaric acid, glutaric acid, oxalic acid, or salt thereof (paragraph 0047).

8. As to claim 4, Tsuchiya discloses that the organic acid or salt is an amino acid selected from glutamic acid, glutamic acid hydrochloride, sodium glutamate

Art Unit: 1765

monohydrate, glutamine, glutathione, glycylglycine, alanine, β -alanine, γ -aminobutyric acid, ϵ -aminocaproic acid, lysine, lysine hydrochloride, lysine dihydrochloride, lysine picrate, histidine, histidine hydrochloride, histidine dihydrochloride, aspartic acid, aspartic acid monohydrate, potassium aspartate, potassium aspartate trihydrate, tryptophan, threonine, glycine, cystine, cysteine, cysteine hydrochloride monohydrate, oxyproline, isoleucine, leucine, methionine, ornithine hydrochloride, phenylalanine, phenylglycine, proline, serine, tyrosine, valine, and a mixture of these amino acids (paragraph 0049).

9. As to claim 5, Tsuchiya discloses that the said abrasive is silicon dioxide (paragraph 0028).

10. As to claim 6, Tsuchiya discloses that the organic acid or salt is a citric acid or salt (paragraph 0047).

11. As to claim 7, Tsuchiya discloses that the amino acid is glutamic acid (paragraph 0049).

12. As to claim 8, Tsuchiya discloses that a metal corrosion inhibitor (or antioxidant) is added to the polishing solution (paragraph 0053).

13. As to claim 9, Tsuchiya discloses that the pH of the polishing fluid is in the range from of 7 to 11 ("preferably 9 or less," paragraph 0043).

Claim Rejections - 35 USC § 103

14. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

Art Unit: 1765

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

15. Claims 1-9 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Tsuchiya et al. (U.S. Patent Appl. Pub. No. 2001/0006224).

16. As to claim 1, Tsuchiya discloses method for removal of a barrier film on a semiconductor wafer by polishing with a polishing pad and a polishing fluid (paragraph 0058), the polishing fluid comprising abrasive particles in the range of 0.1% to 5% by weight (paragraph 0028) and an acid or salt (paragraph 0029) consisting of an organic acid, salt (paragraph 0029) or mixture thereof in the range of 0.5-10% by weight (paragraph 0050) in an aqueous solution at a pH of 7 to 12 ("preferably 9 or less," paragraph 0043). Tsuchiya discloses that an oxidizing agent "may be added" to the polishing slurry (paragraph 0045). Therefore, the oxidizing agent is optional and Tsuchiya includes an embodiment with no addition of an oxidizing agent. Tsuchiya also discloses that inorganic salts "may be at least one..." (paragraph 0029) and thus includes an embodiment with no addition of inorganic salts.

17. Tsuchiya does not expressly disclose that there is no addition of an oxidizing agent. Tsuchiya teaches that the oxidizing agent enhances polishing of the conductive metal (paragraph 0045). Moreover, Tsuchiya discloses that an oxidizing agent "may be added" to the polishing slurry (paragraph 0045) and thus, the oxidizing agent is optional and includes an embodiment with no addition of an oxidizing agent. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made

Art Unit: 1765

to mix a polishing fluid with no addition of an oxidizing agent. One who is skilled in the art would be motivated to mix a solution with only the necessary additives.

18. As to claim 2, Tsuchiya discloses that the organic acid or salt is selected from carboxylic acids, hydrocarboxylic acids containing a hydroxyl group, and amino acids (paragraph 0046).

19. As to claim 3, Tsuchiya discloses that the organic acid or salt is selected from citric acid, maleic acid, formic acid, acetic acid, propionic acid, butyric acid, valeric acid, acrylic acid, lactic acid, succinic acid, malic acid, malonic acid, succinic acid, tartaric acid, glutaric acid, oxalic acid, or salt thereof (paragraph 0047).

20. As to claim 4, Tsuchiya discloses that the organic acid or salt is an amino acid selected from glutamic acid, glutamic acid hydrochloride, sodium glutamate monohydrate, glutamine, glutathione, glycylglycine, alanine, β -alanine, γ -aminobutyric acid, ϵ -aminocaproic acid, lysine, lysine hydrochloride, lysine dihydrochloride, lysine picrate, histidine, histidine hydrochloride, histidine dihydrochloride, aspartic acid, aspartic acid monohydrate, potassium aspartate, potassium aspartate trihydrate, tryptophan, threonine, glycine, cystine, cysteine, cysteine hydrochloride monohydrate, oxyproline, isoleucine, leucine, methionine, ornithine hydrochloride, phenylalanine, phenylglycine, proline, serine, tyrosine, valine, and a mixture of these amino acids (paragraph 0049).

21. As to claim 5, Tsuchiya discloses that the said abrasive is silicon dioxide (paragraph 0028).

Art Unit: 1765

22. As to claim 6, Tsuchiya discloses that the organic acid or salt is a citric acid or salt (paragraph 0047).

23. As to claim 7, Tsuchiya discloses that the amino acid is glutamic acid (paragraph 0049).

24. As to claim 8, Tsuchiya discloses that a metal corrosion inhibitor (or antioxidant) is added to the polishing solution (paragraph 0053).

25. As to claim 9, Tsuchiya discloses that the pH of the polishing fluid is in the range from of 7 to 11 ("preferably 9 or less," paragraph 0043).

Response to Arguments

26. Applicant's arguments (Applicant's Remarks, page 5, fourth paragraph), filed Feb. 9, 2006, regarding the rejection of claim 1-9 under 35 U.S.C. 102(b) as being anticipated by Tsuchiya and the rejection of claim 1-9 under 35 U.S.C. 103(a) as being unpatentable over Tsuchiya have been fully considered, but they are not persuasive.

27. First, Applicant argues the "amended language expressly excludes inorganic salt" (page 5, fourth paragraph). However, claim 1 recites "an organic acid or salt." In general, the claims are given their "broadest reasonable interpretation consistent with the specification." See *In re Morris*, 127 F.3d 1048, 44 USPQ2d 1023 (Fed. Cir. 1997); MPEP § 904.01. Applying this claim interpretation standard, "salt" is construed as including both organic and inorganic salts (i.e., for the broadest reasonable interpretation, "organic" modifies "acid" but not "salt"). It is noted that the features upon which Applicant relies (i.e., organic salt) are not recited in the rejected claim 1.

Art Unit: 1765

Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

28. Second, Applicant argues that Tsuchiya teaches away from the claimed invention of the solution having no addition of oxidizing agents (page 5, forth paragraph). While Tsuchiya teaches that the purpose of the organic acid is for "enhancing oxidation by the oxidizing agent," the reference also teaches a second purpose of "achieving stable polishing" (paragraph 0046). In other words, one interpretation is that Tsuchiya discloses an embodiment with no oxidizing agent, but containing an organic acid for the purposes of achieving stable polishing. Because of this interpretation, Tsuchiya does not expressly teach away from a solution having no addition of oxidizing agents.

Although Tsuchiya's Examples either include: (1) inorganic salts with no oxidizing agent (Table 3); or (2) organic acids with an oxidizing agent (Table 4), the Examples are preferred embodiments, rather than limitations of Tsuchiya's disclosure.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Eric B. Chen whose telephone number is (571) 272-2947. The examiner can normally be reached on Monday through Friday, 8AM to 4:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nadine G. Norton can be reached on (571) 272-1465. The fax phone

Art Unit: 1765

number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

EBC

April 19, 2006

EBC

NADINE G. NORTON
SUPERVISORY PATENT EXAMINER

N